

JOANNA COLE & BRUCE DEGEN

The Magic School Bus

Inside the Earth



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The Magic School Bus

Inside the Earth



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The Magic School Bus

Inside the Earth

By Joanna Cole
Illustrated by Bruce Degen



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IT'S YOUR TURN TO
BE THE ANT MONITOR,
ARNOLD

THE ANT
MONITOR?!

IS IT ALWAYS
LIKE THIS IN
MS. FRIZZLE'S
CLASS?

YOU'LL GET
USED TO IT.

BEEHIVE

PAPER WASP
NEST

Ant Farm

Ant Food

MOUSE HOLE

OWL'S
Nest

NEW
KID



In Ms. Frizzle's class,
we had been learning about
animals' homes
for almost a month.
We were pretty tired of it.
So everyone was happy
when Ms. Frizzle announced,
"Today we start something new."



CHALLENGE OF THE WEEK:
WHICH ONE IS THE EARTH?



1.



2.



3.

DON'T YOU OFTEN
WONDER WHAT IS
INSIDE THE EARTH?

"We are going to study about our earth!" said Ms. Frizzle. She put us to work writing reports about earth science. "And for homework," she said, "each person must find a rock and bring it to school."

NOT OFTEN.

But the next day,
almost everyone had
some excuse.

I COULDN'T FIND
ANY ROCKS.

I FOUND ONE,
BUT MY DOG
ATE IT.

YOUR DOG
ATE A ROCK?



WHERE DO ROCKS
COME FROM? by Wanda

Most of the solid
part of the earth is
made of great masses
of rock.

The small rocks that
we collect are just
pieces that broke off
from these huge masses.



Only four people
had done the homework.
And Phil was the only one
who had found a real rock.



"I guess we'll have to go on a field trip and collect rocks," said Ms. Frizzle.

ARNOLD, THAT LOOKS LIKE STYROFOAM TO ME.

IT COULD BE A STALE CUPCAKE.

YEAH, COVERED WITH DIRT.

YOU ACTUALLY TOUCHED THIS, ARNOLD?

WHAT ARE ROCKS MADE OF?
by Tim

Rocks are made of minerals. Sometimes you see tiny specks of different colors in a rock. Sometimes you see shiny specks. These different specks are the different minerals that make up the rock.



You never know
what will happen
on a trip with Ms. Frizzle.
Her new dress
was a trip in itself.
At first the old school bus
wouldn't start.
But finally we were on our way.

I CAN'T BELIEVE
MS. FRIZZLE
DRESSES LIKE THAT.

YOU'LL GET
USED TO IT.



When we came to the field,
all the kids wanted
to get out of the bus.
But suddenly,
the bus began to spin like a top.
That sort of thing doesn't happen
on most class trips.

FASTEN THOSE
SEAT BELTS,
CHILDREN.

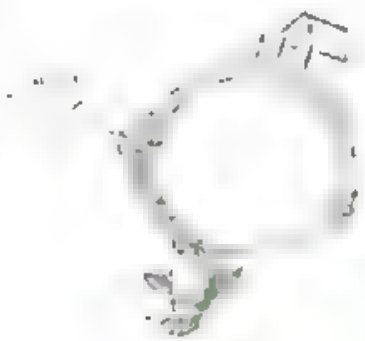
MS. FRIZZLE,
WHEN CAN WE
COLLECT ROCKS?

I'M GETTING
DIZZY.



THE EARTH'S CRUST by John

- The outside of the earth is a shell of hard rock and soil.
- This shell is called the earth's crust.



THIS CRUST IS
AS HARD AS
A ROCK, TOO.

THIS ISN'T EXACTLY EASY.

AT LEAST WE'RE
MISSING SPELLING.

When the spinning finally stopped,
some things had changed.
We all had on new clothes.
The bus had turned into
a steam shovel.
And there were shovels and picks
for every kid in the class.
"Start digging!"
yelled Ms. Frizzle.
And we began making a huge hole
right in the middle of the field.

FIRST, WE WILL DIG
THROUGH THE EARTH'S
CRUST. THE TOP LAYER
OF THE CRUST IS SOIL.

IT LOOKS LIKE
DIRT TO ME.

DIRT IS ANOTHER
WORD FOR SOIL.

OH, GREAT! NOW SHE
CAN READ MY MIND!

WHAT IS SOIL?

by Florrie

Soil is made of ground-up
rock, mixed with clay, bits
of dead leaves, sticks,
and small pebbles.

Without rock there
would be no soil for
plants and trees to
grow in.

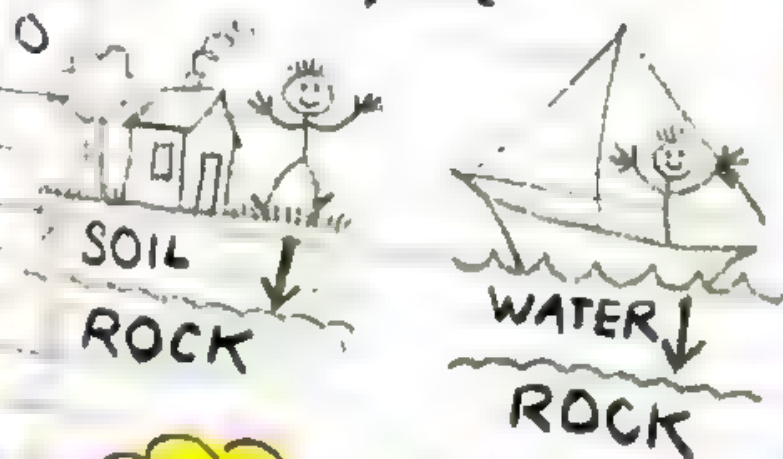


THERE IS ALWAYS
ROCK UNDER YOU
by Shirley

Most of the rock in
the earth's crust is
covered with soil or
water. But if you dig
deep enough, you
will find the rock.

Wherever you are
standing or walking
or floating on earth...

There is rock
under you.



Before long — CLUNK! — we hit rock.
The Friz handed out jackhammers.
We began to break
through the hard rock.

I'M NOT USED TO
MS. FRIZZLE YET!

GIVE IT TIME.



"Hey, these rocks have stripes,"
said a kid.
Ms. Frizzle explained that
each stripe was a different
kind of rock.

MILLIONS OF YEARS AGO,
THESE ROCKS WERE
FORMED IN LAYERS.

THIS TAN ROCK IS
CALLED SANDSTONE.

THIS GRAY STRIPE
IS SHALE.

THIS WHITE ROCK
IS LIMESTONE.

LAYERS-HMMM,
LIKE A CAKE.

DON'T TRY
TO EAT IT!



HOW ROCK LAYERS

WERE FORMED
by Molly

Millions of years ago,
wind blew dust and sand
into lakes and oceans.

The dust and sand
settled to the bottom in
layers called sediment.
Seashells formed layers
of sediment, too.

Over time, the layers
hardened into the sedimentary
rock we see today.

AN EARTH SCIENCE WORD
by Dorothy Ann
Sedimentary comes
from a word that
means "to settle".

We chipped off pieces of the rocks
for our class rock collection.

"These rocks are called
sedimentary rocks, class,"
said Ms. Frizzle.

"There are often fossils
in sedimentary rocks."

SANDSTONE IS MADE
OF GRAINS OF SAND
ALL PRESSED TOGETHER.

SHALE IS MADE OF
MUD AND CLAY
ALL PRESSED TOGETHER.

SANDSTONE
FEELS
GRAINY.

THIS SHALE HAS
A FOSSIL OF A
LEAF IN IT.



THIS LIMESTONE
HAS A FOSSIL OF
A SEASHELL IN IT.

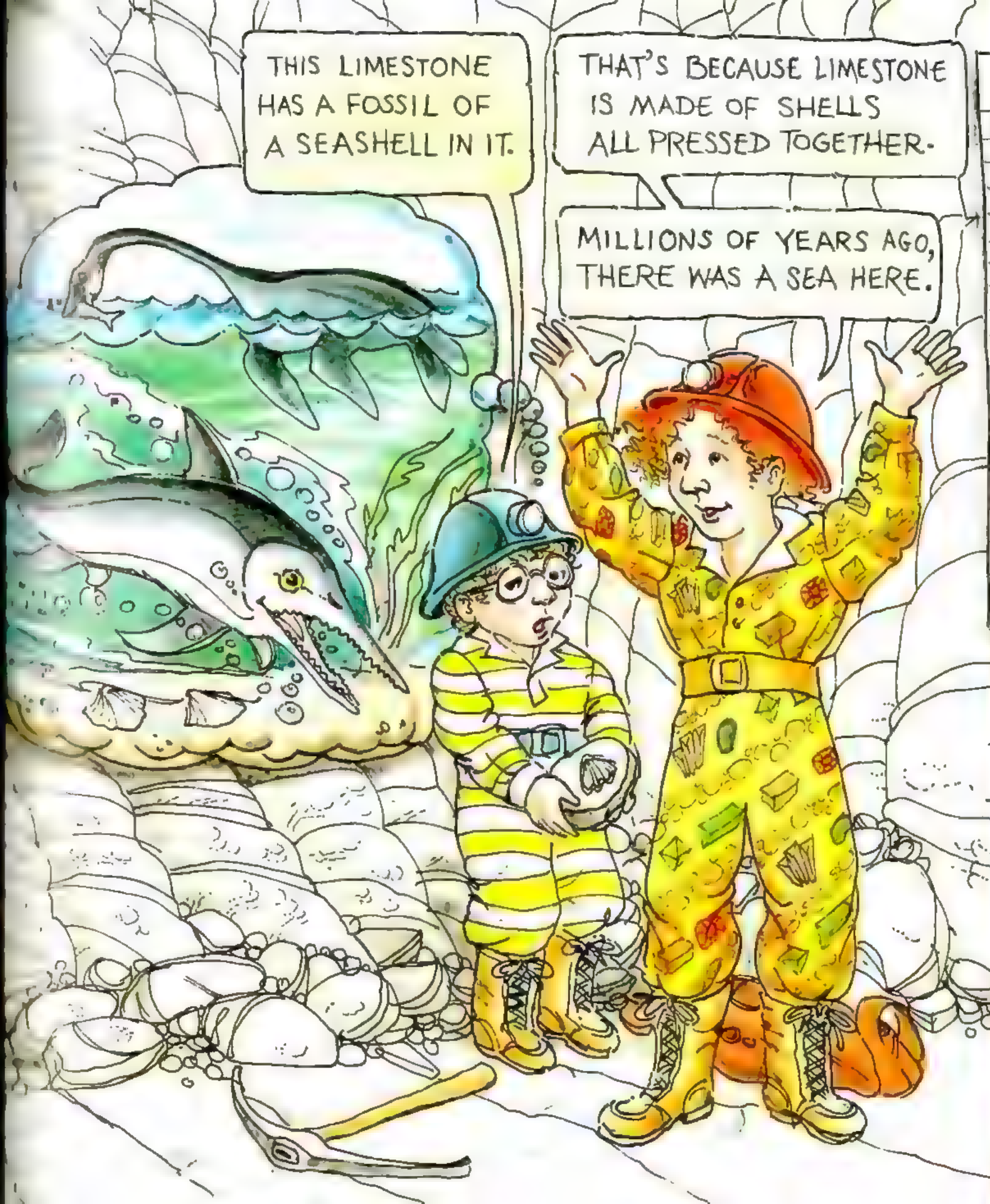
THAT'S BECAUSE LIMESTONE
IS MADE OF SHELLS
ALL PRESSED TOGETHER.

MILLIONS OF YEARS AGO,
THERE WAS A SEA HERE.

WHY THERE ARE FOSSILS IN ROCK LAYERS

by Phoebe


Sometimes a prehistoric
plant or animal died
and was buried in layers
of mud, sand, or
crushed shells. Then
it turned to rock along
with the layers. It
became a fossil.





I'LL NEVER
GET USED
TO THIS.

Wouldn't you know it?
Just when we were finding
lots of fossils,
Ms. Frizzle said,
"Back on the bus, kids."
Then, as we were driving along,
we heard rock crumbling underneath us.
Down we went.
Everything was pitch black.
And we were falling, falling, falling!



CLASS, WE'RE NOW GOING
DEEPER INTO THE EARTH.

I'D RATHER BE
GOING BACK TO SCHOOL.
(I CAN'T BELIEVE I
SAID THAT!)

WE'RE FALLING!

HELP!

WAA-AA

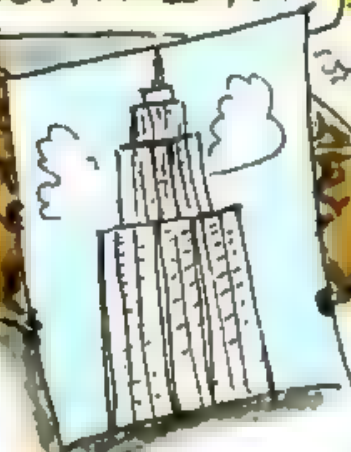
We landed with a bump.
Ms. Frizzle switched on the headlights.
We had fallen through a hole
into a huge limestone cave.
“Rain water has been dripping down
through the earth for ages,”
said Ms. Frizzle.
“The water wore away this cave
in the rock.”

THIS WHOLE CAVE IS
MADE OF LIMESTONE.
CAN YOU FIND MORE
FOSSILS HERE?

HERE'S ONE,
MS. FRIZZLE.

KNOCK IT OFF!

THE EMPIRE STATE
BUILDING IS MADE
OF LIMESTONE, TOO.



We wanted to stay for a while,
but suddenly, the bus sprouted a drill.
It started boring through the rock.
Frizzie shouted, "Follow that bus!"
And down we went.

How STALAGMITES AND STALACTITES ARE FORMED

by Phil

Shapes that look like
cones and icicles
are formed in caves
by dripping water
that contains tiny
invisible bits of
limestone.



HOW TO REMEMBER WHICH IS WHICH:

The word stalagmite
has a 'g' for ground.
The word stalactite
has a 'c' for ceiling.



LOOK! A STALAGMITE
GROWING FROM
THE GROUND...

AND A STALACTITE
HANGING FROM
THE CEILING!

○ ANOTHER
EARTH SCIENCE WORD
by Dorothy Ann

○ Metamorphic comes
from a word that
means "to change."



○ I DIDN'T KNOW
ROCKS COULD
CHANGE.

IT TAKES
MILLIONS
OF YEARS.

The farther down we went,
the hotter it got.

The rocks were harder, too.

"These are rocks that were changed
from one kind to another kind
by heat and pressure,"
explained The Friz.

"Rocks that were changed
are called *metamorphic* rocks."

THIS BEAUTIFUL
MARBLE USED TO
BE LIMESTONE.

THEY MAKE
STATUES
OUT OF
MARBLE.



LIMESTONE + HEAT + PRESSURE + TIME = MARBLE

THIS ROCK USED TO BE SHALE.
IT WAS CHANGED TO SLATE.

SLATE IS HARDER
THAN SHALE.

THIS ROCK
IS VERY HARD.

KNOCK
KNOCK

CUT IT
OUT!

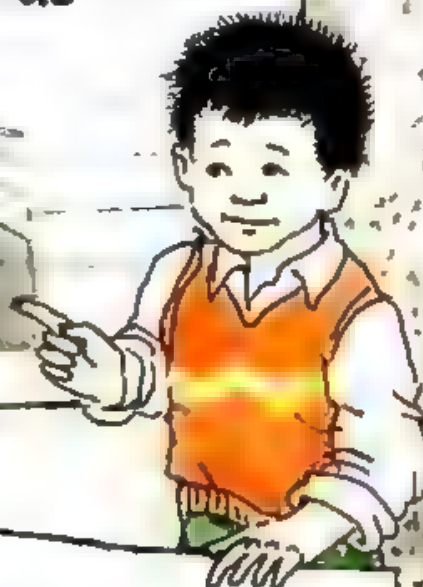


HOW IGNEOUS ROCKS WERE FORMED

by Michael

Melted rock can push up through cracks in the earth's crust.

- When the melted rock cools and hardens, it is called igneous rock.



We went down even farther toward the center of the earth.

We hit rock that was formed billions of years ago from a pool of melted rock under the earth's surface.

Rock like this is called igneous rock.

THIS IGNEOUS ROCK IS CALLED GRANITE. MANY BUILDINGS AND MONUMENTS ARE MADE OF GRANITE.

ARNOLD, WILL YOU CARRY THESE SAMPLES?

EARTH SCIENCE IS HEAVY MAN.

STILL ANOTHER EARTH SCIENCE WORD

by Dorothy Ann


Igneous comes from a word that means "fire".

- The heat inside the earth is like fire. It can melt rocks.

I NEVER KNEW ROCKS COULD MELT!



We had dug all the way
through the earth's crust.
It was so hot now
that Ms. Frizzle told us to
get back in the bus.

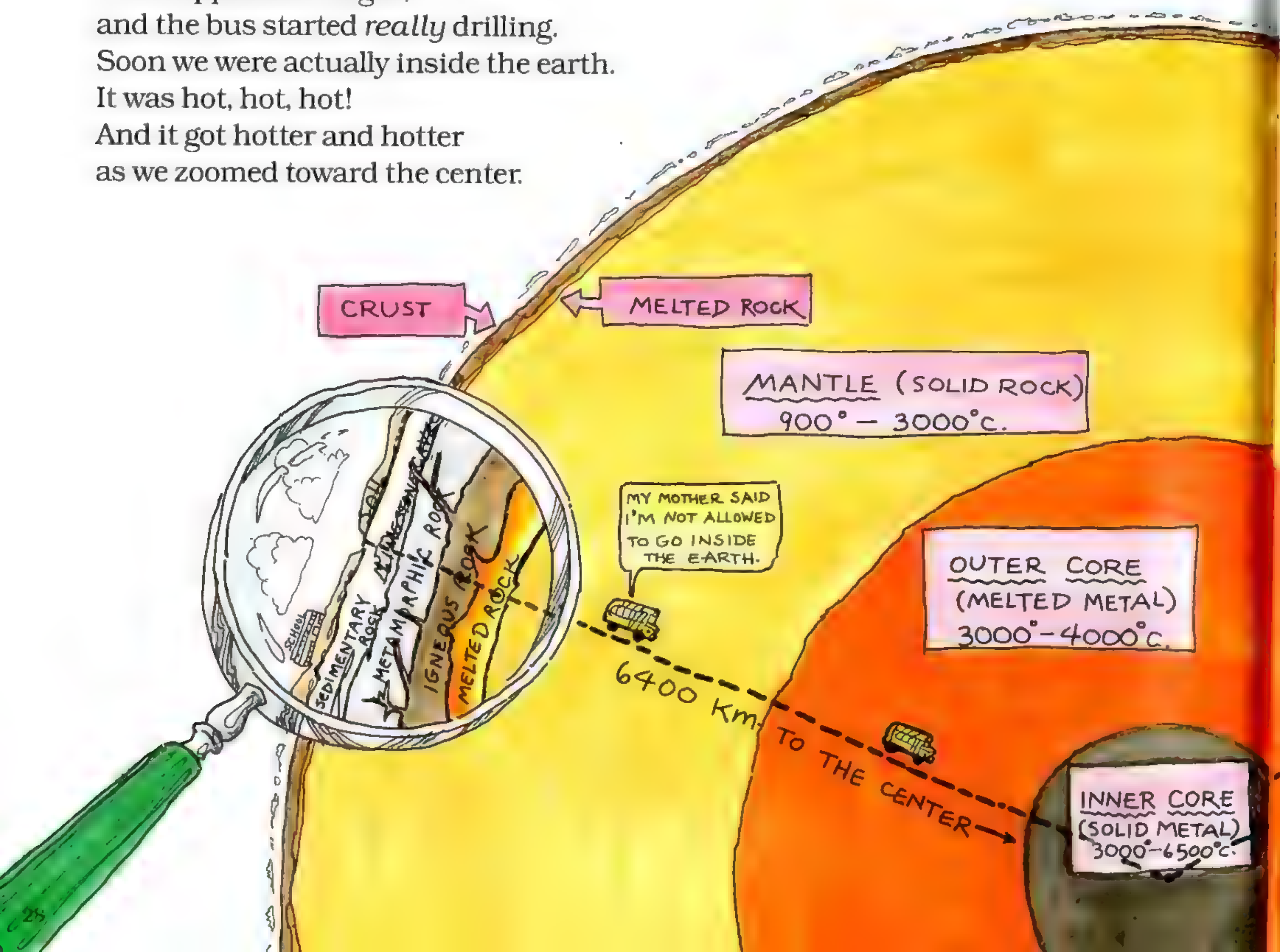


WE'RE LUCKY
THE BUS IS AIR-
CONDITIONED.

WHAT IS YOUR
FAVORITE ROCK?

ROCK 'N'
ROLL!

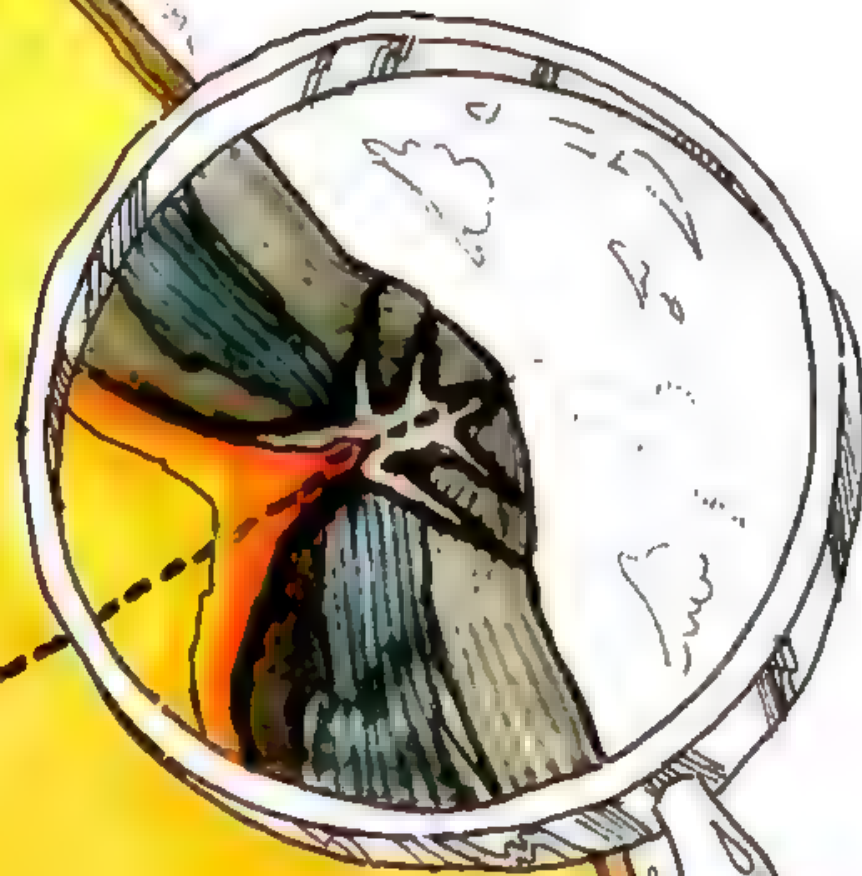
She stepped on the gas,
and the bus started *really* drilling.
Soon we were actually inside the earth.
It was hot, hot, hot!
And it got hotter and hotter
as we zoomed toward the center.



We were glad when Ms. Frizzle
headed out again.

We reached the earth's crust
and drove straight up through
a tunnel of black rock.

It was great to see the sky.



WHAT IS INSIDE THE EARTH by Ralph

Under the earth's crust
there are pockets of
melted rock. Below this
is the mantle, made of
solid hot rock.

The outer core is
liquid metal and the
very center of the
earth, the inner core,

is a ball of solid metal.

WHAT IS A VOLCANO?
by Rachel

A volcano is an
opening in the earth's
crust where melted
rock can flow out.

Volcanoes come in
different shapes:

CINDER
CONE
VOLCANO

COMPOSITE
VOLCANO

SHIELD
VOLCANO

ARE MS. FRIZZLE
AND THE KIDS ON
A CINDER CONE,
A COMPOSITE VOLCANO,
OR A SHIELD VOLCANO?

I WANNA
GO HOME!

Then we looked around.
We had come out on an island
in the middle of the ocean!
"Isn't this wonderful, class?"
said Frizzie.
"We've driven right up
on a volcanic island!"
It didn't look like much.
But if Ms. Frizzle was right,
the whole island was one big volcano!



THE BLACK ROCK
WE'RE WALKING ON
IS BASALT.

THIS SHINY
VOLCANIC GLASS
IS OBSIDIAN.

HEY! THIS
ROCK FLOATS!

THAT'S PUMICE.
AIR BUBBLES INSIDE
MAKE IT THE LIGHTEST
ROCK THERE IS.

I HEAR
RUMBLING!

IS THAT YOUR
STOMACH, ARNOLD?

We were nervous, but Ms. Frizzle made us collect some rocks. She said they had all hardened from melted rock that had come out of the volcano. Then, suddenly, we heard rumblings from below.



VOLCANOES MAKE
NEW LAND

by Arnold


The material that comes
out of a volcano is
melted rock called lava.
When lava cools, it
hardens into new rock.
In time, soil forms
on the rock and plants
can grow.

I DIDN'T KNOW
VOLCANOES
COULD BE USEFUL!

We scrambled into the bus.
The Friz turned the ignition key
and stepped on the gas.
Nothing happened.
The bus would not start!
We thought we were goners!



Red-hot lava came streaming
out of the volcano.
Some of it shot into the air
like a fountain.
Some of it flowed over the land
like a river.
Our bus went along with it—
right into the sea.

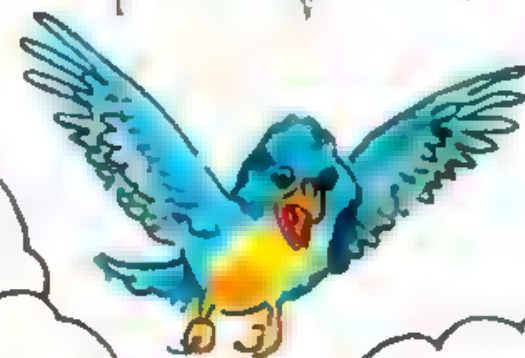


CLASS, WHEN THIS LAVA HARDENS,
IT WILL BE THE NEWEST ROCK
ON EARTH.

WHO CARES?
JUST GET US
OUT OF HERE!

HISSESSSS
HISSESSSS
HISSESSSSSS

When the red-hot lava hit the water,
it made a huge cloud of steam.
All we could see was white.
We seemed to be rising
with the steam and floating along.
No one knows how long
we floated in the cloud...



WHERE ARE WE?

I DON'T KNOW,
BUT I HAVE TO BE
HOME BY 3:30.



but when it finally cleared,
we were back in the school parking lot.



It had been a weird trip,
but we *did* get
a great rock collection
for our classroom.



ARNOLD,
THAT'S NOT A ROCK
THAT'S
STYROFOAM.

NOT AGAIN!

Rock Collection

by MS. FRIZZLE'S
CLASS

HEY!
I'M NOT
A ROCK!



SHIRLEY'S ROCK LIMESTONE



TYPE: Sedimentary
(formed from shells)

USES: Buildings,
chalk, cement,
fertilizer

Amanda Jane's rock MARBLE



TYPE: Metamorphic
(formed from limestone)

USES: Statues,
monuments, buildings

Phoebe's rock SHALE



TYPE: Sedimentary
(formed by mud)

USES: Ground up and
mixed with limestone
for cement, brick

Wanda's rock GRANITE



TYPE: Igneous

USES: Monuments,
buildings, curbstones

JOHN'S rock SLATE



TYPE: Metamorphic
(formed from shale)

USES: Roofing tile,
flagstones, chalkboards

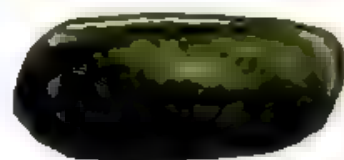
Michael's rock SANDSTONE



TYPE: Sedimentary
(formed by sand)

USES: Buildings,
grindstones

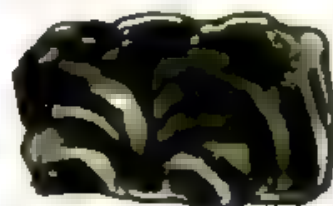
MOLLY'S rock BASALT



TYPE: Igneous
(Volcanic)

USES: Road Building

Rachel's rock OBSIDIAN



TYPE: Igneous
(Volcanic)

USES: Decoration,
Indian Arrowheads

Florrie's rock PUMICE



TYPE: Igneous
(Volcanic)

USES: Ground-up in
scouring powder

Phil's rock QUARTZITE



TYPE: Metamorphic
(formed from
sand stone)

USES: Millstones for
grinding grain,
road building



A WORD WITH THE AUTHOR AND THE ARTIST

The first reader of this book called to complain. He said the book was full of mistakes. We recorded the conversation to help you decide which things are true and which were put in to make the story more exciting.

READER: This book is full of mistakes!

AUTHOR: It is not!

ARTIST: Everything in this book is absolutely true and really happened.

READER: What about the beaver lodge on page 7?

AUTHOR: Oh, that. Well, I guess that *would* be too messy in a real classroom.

READER: And the beehive?

ARTIST: That, too. But everything else is fact.

READER: Oh, come on! You mean kids can use jackhammers (page 16), and a bus can change into a steam shovel (page 14) and a drill (page 23)?

AUTHOR: Well, er, now that you mention it, that is not really possible.

READER: And do you expect me to believe that a bus can go through the center of the earth (page 28)?

ARTIST: Yes....

AUTHOR: Maybe....

ARTIST: Well, actually, no. The bus couldn't do that, either.

AUTHOR: Even if a bus *could* drill its way through, the distance is so long that the trip would take months, even years.

READER: And what about the heat?

AUTHOR: Okay, okay! It's white-hot in the center of the earth. The bus would be burned up in a minute.

READER: Isn't it kind of ridiculous to say that air-conditioning would help?

AUTHOR: Gee, you're a tough cookie! Okay, you're right. Air-conditioning could not make any difference in that kind of heat.

READER: And the bus could not flow in lava and go up in a cloud of steam (pages 33-34)?

ARTIST: Give us a break! You're right again. That's not true, either.

READER: But you said *everything* was true!

AUTHOR: Everything *else* is. Honest!

READER: Everything else is true? There truly are sedimentary, metamorphic, and igneous rocks?

AUTHOR: Certainly!

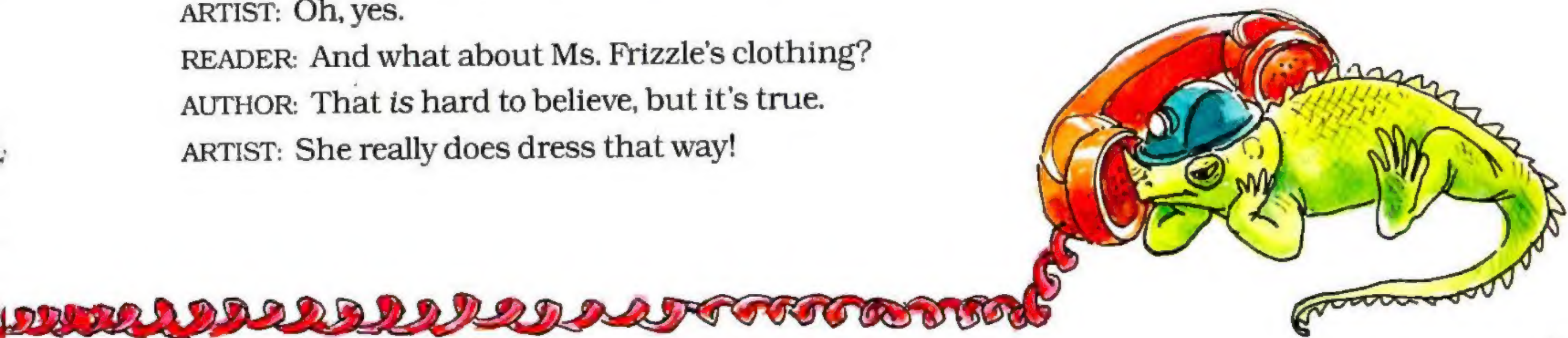
READER: And lava really does harden into new rock?

ARTIST: Oh, yes.

READER: And what about Ms. Frizzle's clothing?

AUTHOR: That *is* hard to believe, but it's true.

ARTIST: She really does dress that way!



HOW TO SAY OUR NEW EARTH SCIENCE WORDS

basalt
(buh-SAWLT)

granite
(GRAN-it)

igneous
(IHG-nee-uhs)

lava
(LAH-vuh)

metamorphic
(met-uh-MAWR-fik)

obsidian
(ahb-SIHD-ee-un)

pumice
(PUHM-ihs)

quartzite
(KWAWRT-site)

sedimentary
(sed-uh-MEN-tar-ee)

stalactite
(stuh-LAK-tite)

stalagmite
(stuh-LAG-mite)





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